PROPOSED NEW CLAIMS

43. A remote sound detector for detecting a hidden source of acoustic signals, comprising:

a) a transmitter operably arranged for producing a train of pulse to pulse coherent signals and for transmitting the signals as a beam into a region of atmosphere which is located above the hidden source of the acoustic signals;

b) a receiver operably arranged for receiving resultant signals from an intersection of the beam with the acoustic signals in the region of atmosphere; and

c) a detector operably connected to the receiver and arranged for determining a presence of the hidden source of the acoustic signals from a phase difference between successive resultant signals.

44. The remote sound detector of claim 43, wherein the detector is operative for determining phase differences between immediate successive pairs of the resultant signals.

45. The remote sound detector of claim 43, wherein a laser source is operably arranged for producing a laser beam, and a modulator for modulating the laser beam to produce the train of signals.

46. The remote sound detector of claim 45, wherein an interferometer is operably arranged for providing an interference pattern between the laser beam and each resultant signal.

47. The remote sound detector of claim 46, wherein a photoreceiver is operably arranged for detecting and producing an output signal corresponding to changes in each interference pattern.

48. The remote sound detector of claim 47, wherein a sampler is operably arranged for sampling the output signals from the photoreceiver, and a comparator is operably arranged for comparing the output signals from immediate successive pairs of outputs from the photoreceiver to produce a result.

49. The remote sound detector of claim 48, wherein an accumulator is operably arranged for accumulating each result.

50. The remote sound detector of claim 48, wherein a loudspeaker is operably arranged for reproducing audible output of the result.

51. The remote sound detector of claim 47, wherein a sampler is operably arranged for sampling the output signals from the photoreceiver at different ranges to the hidden source, and a processor is arranged for determining a curvature of an acoustic signal wavefront from the hidden source, for determining a first circle from the wavefront substantially perpendicular to the beam which intersects the acoustic signals, for calculating a second circle as for the first circle with the beam directed to a different range, and for locating the hidden source of the acoustic signals as the point that the first and second circles join.

52. A method of remote sound detecting a hidden source of acoustic signals, comprising the steps of:

a) transmitting a train of pulse to pulse coherent signals as a beam into a region of atmosphere which is located above the hidden source of the acoustic signals;

b) receiving resultant signals from an intersection of the beam with the acoustic signals in the region of atmosphere; and

c) determining a presence of the hidden source of the acoustic signals from a phase difference between successive resultant signals.

53. The method of claim 52, including determining the phase difference between immediate successive pairs of the resultant signals.

54. The method of claim 52, including producing the train of signals by producing a laser beam and modulating the laser beam.

55. The method of claim 54, including providing an interference pattern between the laser beam and each resultant signal.

56. The method of claim 55, including detecting and producing an output signal corresponding to changes between each interference pattern.

57. The method of claim 56, including sampling the output signal, comparing the output signals from immediate successive pairs of the output signals, and producing a result.

58. The method of claim 57, including accumulating each result.

59. The method of claim 57, including providing an audible output of the result.

60. The method of claim 56, including sampling the output signal at different ranges to the hidden source, determining a curvature of an acoustic signal wavefront from the

hidden source, determining a first circle from the wavefront substantially perpendicular to the beam which intersects the acoustic signals, calculating a second circle as for the first circle with the beam directed to a different range, and locating the hidden source of the acoustic signals as the point that the first and second circles join.